

Development of a Mobile Inspection Package

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LONG-TERM GOALS

To Develop a Mobile Inspection Package (MIP) capable of surveying ship hulls, seawalls and pilings, and seafloors. The MIP will use a suite of complimentary sensors combined with a survey quality navigation system allowing the data to be geodetically referenced.

OBJECTIVES

- Developed a true North seeking attitude heading reference system (AHRS) capable of fitting in a 12.75" AUV in conjunction with a commercial vendor of sub sea navigation technologies
- Purchase the above AHRS
- Purchase a DIDSON sonar to integrate with the MIP
- Purchase an ISS laser scaling video camera system to integrate with the MIP
- Purchase an ORE TrackPoint II+ USBL acoustic tracking system
- Design and fabricate a precision mounting assembly for USF's "AUV" ROVEX and Rosebud (USF's ROV) that will guarantee alignment of all sensors in the MIP including the DIDSON sonar, ISS camera, AHRS, DVL and laser line scanner (ROBOT)
- Documentation of operational procedures and maintenance for MIP

APPROACH

USF will order a DIDSON sonar, an ISS laser-scaling camera, an ORE Trackpoint II+. USF will also order an AHRS after an appropriate system has been found (one that will fit in a 12.75" AUV payload).

While the above items are being ordered, a precision mounting assembly for both ROVEX and Rosebud will be designed and fabricated. This precision assembly will ensure co-registration among

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the laser line scanner, the DIDSON sonar and the sub sea navigation elements. After the sensors are received, the MIP will be assembled and calibrated.

WORK COMPLETED

- All of the sensors have been ordered and all of the items have been received except for the DIDSON, which is due to come in by the end of September 2003 and the AHRS which is due in by 25 September, 2003.
- The mounting assemblies for all items except the DIDSON have been fabricated and installed
- USF has purchased a CDL Ring Laser Gyro (RLG) based AHRS in a horizontal configuration capable of fitting in a 12.75" AUV and a 9" diameter AUV (Figure 2). The CDL AHRS is based on the Kearflott T16-B (RLG) and is housed in a 1000 m rated housing.
- Initial calibration of the alignment system has been performed using a larger rental CDL RLG AHRS (Figure 1).

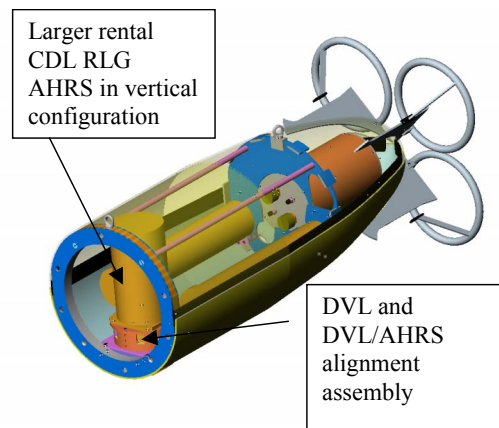


Figure 1. Rental CDL installation in ROVEX for system calibration

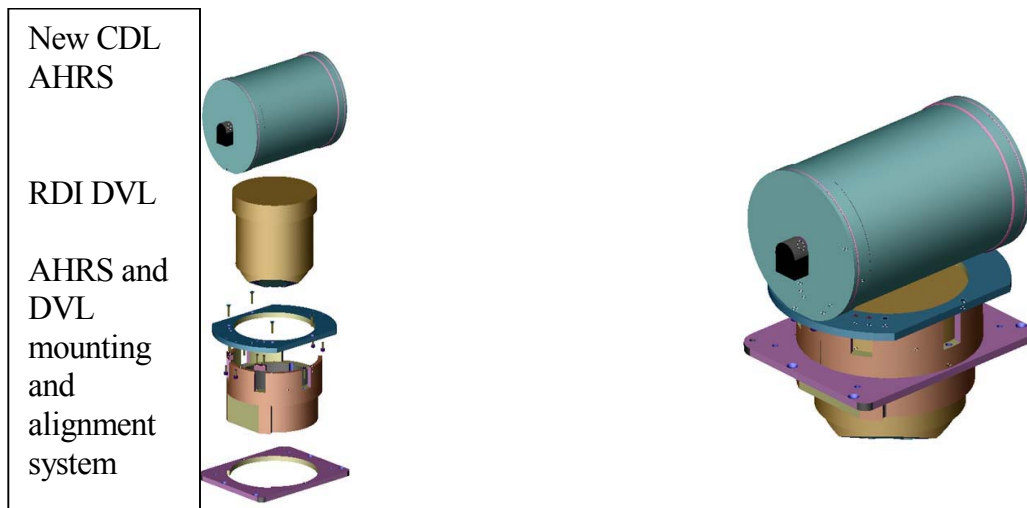


Figure 2. The new smaller CDL shown in the alignment assembly with the RDI DVL. The horizontal CDL is only 7" in diameter and 10.5" long. All brackets have been fabricated.

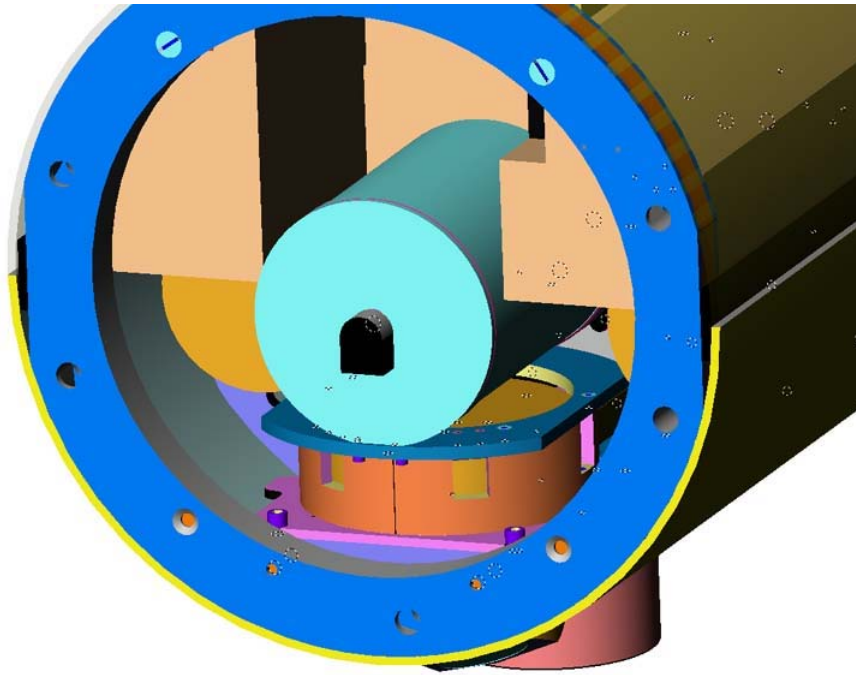


Figure 3. Horizontal CDL AHRS/RDI DVL alignment assembly installed in ROVEX. Compare size to Figure 1. To insure AUV and payload alignment, both the DVL and the AHRS are aligned with each other and with the mating ring shown in blue.

ONGOING TASKS

- Documentation and integration of the MIP is still ongoing.
- DIDSON payload (capable of being run with the Laser Line Scanner payload or by itself) will be completed Dec 2003.

RELATED PROJECTS

This project is for the development of Advanced Port Security Systems. Related projects would include ONR# N00014-03-1-0750, Testing and Evaluation of the Mobile Inspection Platform, ONR# N00014-02-1-0719 and ONR# N00014-02-1-0825, Autonomous Underwater Vehicle for Homeland Defense.